

Patent Application
NC 82,919

Remarks/Arguments

In the specification, the title has been changed to reflect more clearly the claimed subject matter and the paragraph at p. 11, line 9, has been amended for the sake of clarity.

Claims 1-20 remain in this application. Claims 1, 7, 13, and 19 have been amended and remainder of the claims are original claims.

In reference to the rejection of claims 1-12 on 35 USC 102(b) as being anticipated by the Hamden-Smith reference, claim 1 was amended, inter alia, to define the emitting material as being a non-oxide and single phase or single compound. The Hamden-Smith reference discloses oxygen-containing phosphor emitters and that certain emitters are oxygen-containing multi phase.

In our patent application, we have discussed non-oxide phosphors and have highlighted the issues that current sulfide phosphors have phosphor particle surface degradation, sulfur dioxide and hydrogen sulfide gases formation, and poisoning the field emitter tips. We highlighted the need for a protective coating on the sulfide phosphor to prevent degradation.

Claims 1-20 were rejected under 35 USC 103(a) as being unpatentable over the Peterson ('685) reference, the Peterson ('100) reference or the Hamden-Smith reference. It is believed that the Peterson references have same or similar disclosure and will be treated as being same for purposes herein.

Patent Application
NC 82,919

The Peterson references disclose a phosphor made of a particle having a photo absorption band in the UV range (see line 34 in col. 5); coated with a diffusion barrier 25 thereon of UV-transmitting, chemically inert material (see lines 37-38 in col. 5); and a coating 30 disposed over the diffusion barrier 25, coating 30 including an electron-excitable, UV-emitting material (see lines 41-44 in col. 5). In this respect, claim 1 recites particles in powder form, when operating under accelerating voltages of 100-10,000 volts last in excess of 10,000 hours of continuous operation without losing 50% of its original brightness, for use as a phosphor, each particle comprising

(a) a non-oxide and single phase emitting material that can emit visible light in response to direct excitation caused by electrons operating at low voltage, and

(b) an electrically conducting, visible light transmitting coating material disposed on said emitting material to provide an electrical pathway across said particle.

The Examiner contends that claims 1-20 are obvious over the Peterson and the Hamden-Smith references. How can this be? Particles (10) in the Peterson references are excited by UV light from layer (30) whereas corresponding claimed particles are directly excited by electrons. By way of explanation, in our case, direct excitation of the phosphor takes place when an electron beam impinges on the phosphor, thus resulting in direct excitation which

Patent Application
NC 82,919

emits visible light. However, in the Petersen references, an electron beam impinges on coating (30) which emits UV light which UV light excites phosphor (10) which emits visible light. Therefore, excitation in the Petersen references is indirect.

The herein-claimed electrically conducting and visible light transmitting coating material probably corresponds to layer 30 in the Peterson references, in the Examiner's view. However, as noted above, layer 30 is a UV-emitting material whereas herein, claim 1 expressly recites that the electrically conducting coating material transmits visible light and UV is not visible light.

As to the Hamden-Smith reference, claim 1 now calls for non-oxide, single phase emitting material which clearly distinguishes, in the unobviousness sense, over this reference. Prior art belief was that non-oxygen containing emitters, such as the sulfides, were not chemically or thermally durable and, therefore, would be severely degraded during attempted coating processing. Therefore, it was obvious not to coat the non-oxygen containing emitters. Claim 7, and other claims, recite sulfide emitters which cannot withstand even 300° C.

However, the Examiner should note that all claims herein are now limited to non-oxide powder particles for use as a phosphor that, when operating under accelerating voltages of 100-10,000 volts, last in excess of 10,000 hours of continuous operation without losing 50% of its original brightness. This limitation, it

Patent Application
NC 82,919

is believed, renders the herein-claimed subject matter unobvious over the Peterson and the Hamden-Smith references.

Applicant respectfully request that a timely Notice of Allowance be issued in this case.

It is hereby petitioned to extend the time for reply. Please charge the fee for extension of time to our account #50-0281.

Respectfully submitted,

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Fax Certification

I hereby certify that this document is being faxed to the PTO on the date shown below:

9-25-03
Date

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